

REMARKS

Claims 1-14 are all the claims pending in the application.

New claims 13 and 14 have been added. Support for the new claims can be found, for example, at page 14, first full paragraph, of the present specification.

Claim 9 has been rewritten in independent form in view of the Examiner's indication that claims 9 and 10 are allowable. Claim 10 depends from claim 9, and thus, it is submitted that claim 10 is allowable in its present form.

Entry of the above amendments is respectfully requested.

I. Response to Rejection of Claims 1-8, 11 and 12 under 35 U.S.C. § 103(a)

At pages 2-4 of the Office Action, claims 1-8, 11 and 12 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over DeVoe et al. (U.S. Patent 6,855,478) in view of Hayashi et al. (U.S. Patent 6,132,930).

Applicants respectfully traverse the rejection and submit that DeVoe does not render the present invention obvious.

DeVoe relates to a method of fabricating an optical element. At col. 7, lines 27-36, DeVoe states:

FIG. 1 shows how imagewise exposure of selected portions of body 20 formed photodefined, three-dimensional waveguide 26 within body 20. Portions 28 of body 20 that are outside the photodefined portions constituting waveguide 26 remain at least substantially uncured. Uncured portions of body 20 may be removed from waveguide 26 by a suitable technique, e.g., washing with a solvent or the like. This provides the recovered waveguide 26 as shown in FIG. 2. As an option, the resultant optical element 26 may be blanket irradiated with a photocuring fluence of energy.

Thus, in the invention of DeVoe, a desired three-dimensional waveguide is obtained by curing a photodefinable material by imagewise exposure, and removing the uncured portions of body 20.

See also Example 1, col. 16, lines 52-60. In addition, DeVoe teaches that the optical element can be irradiated after the uncured polyimide is removed.

In contrast, in the present invention, the polyamic acid film is irradiated, and the irradiated site is more increased in the refraction index than the non-irradiated site. When the polyamic acid film is irradiated with the laser beam while converging it in the polyamic acid film to form the core precursor, neither chemical nor physical changes occur in the non-irradiated area of the polyamic acid film, and the refraction index thereof is lower than that of the area irradiated with the pulse laser beam. Accordingly, after imidation of the polyamic acid, the non-irradiated area functions as the clad of the optical waveguide. Thus, after the core precursor is formed in the polyamic acid film, the polyamic acid is heated for imidation, whereby a polyimide optical waveguide having a three-dimensional core in a polyimide resin film (as shown in Fig. 1) is obtained. *See e.g.* pages 20-21 of the present specification.

Thus, DeVoe does not teach or suggest the present invention, particularly heating the polyamic acid film to imidize the polyamic acid to obtain an optical waveguide having a continuous core region where the refraction index has been changed in the polyimide film.

In addition, Hayashi does not make up for the deficiencies of DeVoe since Hayashi is not directed to an optical element.

In view of the above, withdrawal of the rejection is respectfully requested.

II. Conclusion

For the above reasons, reconsideration and withdrawal of the §103 rejection, and allowance of claims 1-14 are respectfully requested.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No.: 10/700,635

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If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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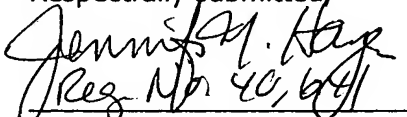
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